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TABLE OF CONTENTS.

PAGE.

Editorial Article:—New York's Proposed Speed-road 431
The California Fruit-supply in New York . . . . . *M. B. C.* 432
Botanical Notes from Texas.—XII . . . . . *E. N. Plank.* 433
The Use of the Generic Name Halesia . . . . . *Professor N. L. Britton.* 433
The Water-garden at Clifton, New Jersey. (With figure.) . . . *J. N. Gerard.* 434
Cultural Department:—Cauliflower for Winter-forcing 435
Mushrooms . . . . . *E. O. Orpet.* 436
Noteworthy Late-flowering Shrubs . . . . . *J. G. Jack.* 436
Notes from a Northern Garden . . . . . *F. H. H.* 437
Roses . . . . . *W. H. Taplin.* 437
The Vegetable-garden . . . . . *T. D. Hatfield.* 437
Correspondence:—The Winter Care of Water-lilies . . . . . *W. T.* 438
Mildews as Influenced by Climate and Variety . . . *Professor L. H. Pammel.* 439
Tecoma MacKenni . . . . . *J. C. Harvey.* 439
Recent Publications 439
Notes 440
Illustration:—Victoria regia in Clifton, New Jersey, Fig. 64 435

New York's Proposed Speed-road.

CENTRAL PARK is in a real sense a national possession. When the Legislature of this state passed an act to condemn a considerable portion of it and turn it into a dirt-road for fast driving, the whole country sympathized with that masterful uprising of the people here which in a week's time compelled the Governor, the Legislature and the city's officials to turn squarely about and meekly undo their own work. The whole country, too, was interested to know that another place on Manhattan Island had been secured for a speedway, because it was thought that if this were constructed the park would be forever relieved from the danger of invasion from an organized effort by the owners of fast horses. This proposed road extends for two miles and a half along the western bank of the Harlem River, most of the land being now in its natural condition, and, like most of the original surface of the island, a place of picturesque beauty. The Harlem River at this point has little commercial importance, and, therefore, when speaking, last week, of the portions of the city's water-front which had been rescued from commerce and devoted to public recreation, we did not mention this new drive, for it does not in any way come in conflict with commerce.

According to the plans which have been adopted, however, this attractive river-bank will be shut off from every one who does not and cannot enjoy it in a road-wagon. In other words, the plans which have been adopted by the Park Department provide for only one sidewalk, and that is on the western side of the road. On the side next to the river there will be a low wall, and not even standing-room for a pedestrian. The only member of the Park Board who protested against this plan, Mr. Paul Dana, justly characterized the act to deprive people of their right to the river-bank as an outrage. The enormity of the act is heightened by the fact that the road passes through two parks already established, both of which now front on the water, so that this much of the shore has already been secured by the city for purposes of recreation; but, under the plans approved, the road will despoil the public of this privilege, and High Bridge Park and Washington Park will be practically moved back a hundred and fifty feet from the river.

As this road is intended for light-wagon driving, there might be some possible justification for giving the exclusive use of the place to the people who drive, if a walk for pedestrians would interfere with their privileges, but this is not the case. There is abundant room for wheel-way and foot paths, and in many respects, especially in the opportunity it would give for the planting of trees, a walk on the river-side of the road could make it more agreeable than it would be without it. The argument, that people crossing the road would interfere with the trotters and imperil their own lives, is self-destructive, because the great mass of the people who visit the road will come from the east side of it and will be compelled to cross it under the present plan at its southern entrance, which will be the point of greatest congestion, in order to get on the single sidewalk which is provided. Of course, it should be remembered that a walk on two sides would accommodate twice as many people as a walk on one, and if, as the trotting men have always argued, there is a great longing of the populace to look at fast steppers in action, accommodation should be provided for them. But there are hours of the day and seasons of the year when there will be little trotting there, while all the year through the land and water view will invite visitors by its picturesque beauty, and in time, under proper management, this might become one of the most interesting walks in the city, or, indeed, in any city of the world. Besides this, the Harlem River is a favorite boating-place, and persons who land there should certainly find a place to stand on when they reach the shore. This boating privilege has always been spoken of as one of the advantages of Washington Park and of High Bridge Park, but under the present scheme no one will be able to reach the park from the river. That portion of the river which is skirted by the speed-way is also especially adapted to regattas, and the idea of excluding people who wish to witness these displays from the banks of the river is monstrous. But there is no need of enumerating the objections to this scheme. They are so obvious that its promoters will, no doubt, be driven to retreat from an utterly untenable position, and the sooner they do it the better.

The purpose of this article is to invite attention to the fact that in this year of grace, 1893, the Park Board of the first city in the United States have not thought it worth while to consult with the one man in their department to whom all matters touching the design of pleasure-grounds are legitimately referred. Mr. Calvert Vaux, who was one of the designers of Central Park, is still in the city's service, and yet the planning and executing of this work is handed over to an engineer who cuts his way along the river-bank as remorselessly as the builders of the West Shore Railroad have done along the Hudson, and with no more regard for the defacement of the scenery than was manifested by them. A Municipal Art Association has been formed in this city for the purpose of enhancing the beauty of our public possessions. These artists and laymen believe that true art is not something to interest an occasional amateur, but something which should be promoted for the benefit and enjoyment of the whole people; that beauty in public works has a definite municipal value, always and everywhere. It will be of little use to build galleries for pictures and statues, or even to rear dignified public buildings, while the element of beauty is not considered as an essential one in our public pleasure-grounds. There is just as much need of artistic fitness in the design of a work like the speed-way as there is in that of an art museum or a city hall. Indeed, there is much more, for people go to public buildings for business. They may visit a museum out of curiosity, but they go to a public pleasure-ground with all business cares thrown aside, and in that receptive spirit which is ready to delight in the beauties which nature and art have spread before them.

If there ever was a time when a body like the Municipal Art Association should endeavor to make its influence felt it is just now, when the officials entrusted with the administration of our public pleasure-grounds have shown such contempt for the counsel of their own chosen adviser in matters of landscape-art. As usual, there is no conflict in this case between the demands of the highest beauty and of the greatest usefulness. It is not proposed to injure the road for driving purposes. The alignment, the grading and the surface-quality of the speed-way can be made as perfect as possible, and it is only asked that by judicious planting of trees, the masking of raw surfaces with appropriate vegetation, the protection and development of the natural beauties of a picturesque location, the place may be made attractive to the entire population of the city as well as to the fortunate owners of fast trotting horses; and that provision be made for the enjoyment of this beauty by all classes, instead of limiting that privilege to a small fraction of the people. The reasonableness of such a request is evident. When the people of the city fully appreciate the situation, they will not allow themselves to be robbed of their rights.

The California Fruit-supply in New York.

CHEAP freights and refrigerator-cars have brought the Pacific coast so close to the Atlantic that a very considerable portion of the fruit-supply of our eastern cities is now carried entirely across the continent. The experiment of bringing California fruit to New York was first tried in 1868, when a venture was made with three car-loads of winter pears and one of grapes, at a cost of from one thousand to thirteen hundred dollars a car for freight. But, evidently, there was little encouragement to continue this traffic, for nineteen years later, or in 1887, only fifteen car-loads reached this market. These small supplies were handled by fancy-fruit dealers at high prices, and California fruit continued to be rare and a luxury until 1889, when four hundred car-loads were distributed in New York, about one dealer in twenty being among the purchasers. In 1890, when there was a general failure of the eastern fruit-crops, a great impetus was given to the California trade, and the business done in New York was nearly doubled. These fruits have steadily gained in public favor as they have improved in quality, and since the first cherries arrived this year, in the middle of May, in spite of poor railroad service and the largest crop of peaches ever produced on the Delaware peninsula, eight hundred car-loads of fruit from California have been sold here already this year.

The earliness or lateness of the season on either coast is of great importance in the competition between eastern and western fruits, as this year, for example, when a late season in California delayed the first shipment of cherries, which arrived here two weeks later than usual, and two days after the North Carolina fruit—the result of this tardiness being a sluggish start for the California fruit. In the order of arrival, apricots came with some of the earliest cherries, and Clyman plums were here on the 23d of June, the Cherry and Royal Hative varieties arriving a few days later. Alexander peaches were only a day behind the plums, the first Bartlett pears and Alexandra apples coming July 11th, nectarines and grapes also arriving during this month, and Tokay grapes in August. The season for peaches and plums is drawing to a close, and grapes and winter pears constitute the principal receipts, with a few pomegranates and new figs. Almonds and English walnuts will soon follow, and dried fruits, oranges and lemons round out the California fruit year in the eastern markets. Orange cultivation is successful in a higher latitude in California than in any other part of the world, and the groves of the state comprise about 41,000 acres of bearing trees, with half as many more young trees not yet productive. Six thousand car-loads of oranges were shipped out of the state last spring, of which one-third was Riverside Navel fruit, altogether the best California orange seen here. This fruit arrives in small lots soon after the first of January, and in larger quantities during the late spring months, when it succeeds the last of the Florida crop.

But 401,415 acres out of nearly 156,000 square miles are planted in fruit in California, and this state seems to have the ability to supply an almost unlimited demand. While these western fruits do not generally equal ours in flavor, at least as they reach us here, they are larger, more beautiful, and have remarkable keeping qualities. California grapes are an important acquisition, since they are mainly varieties of the European or Vinifera type, and quite distinct in texture and flavor. Besides this, they keep in a fresh condition much longer than the native varieties. The greatest care is used in picking and in the selection of sound fruit, and eastern growers have much to learn from western shippers in the art of packing. Cherries, for instance, in prime condition and of the brightest color, all of an even size, are packed in perfectly regular rows, and make a most attractive appearance in their neat boxes on the fruit-stand. Pears and peaches are packed with no less care, each fruit wrapped in tissue-paper, and often placed in separate compartments. When the crop of eastern fruit is abundant and of good quality, all the California fruit that can be got here sells in competition with it at considerably higher prices, and, in spite of the long journey, the California grower generally gets a larger net return than the grower in Delaware and other fruit-producing districts near by.

Except a few car-loads in a season, all the fruit from California has been sold here by auction since 1887. The sales are conducted by Messrs. Brown & Seccomb and Mr. E. L. Goodsell, Porter Brothers Company, the Earl Fruit Company and the National Fruit Association being the largest shippers. The local buyers are notified of the sale by the receiver, who has had telegraphic advices from the railroad company a day in advance. Cars reaching Jersey City during the night are at once forwarded to New York docks on floats, and by 8 o'clock in the morning these are unloaded. The crates and boxes of fruit are stacked on the dock, that of each grower by itself, and the boxes opened for examination. The sales are attended by from two to three hundred buyers, made up of wholesale dealers, commission merchants, brokers acting for principals in different parts of the country, jobbers and small dealers who sell to peddlers. Catalogues are provided, and preferred lots noted by the prospective buyers. At 9 o'clock the sale begins in the auction-room, which is on the dock, and the fruit is bid off in lots of from two to one hundred packages. It is packed in trucks for delivery as fast as sold, and early afternoon finds everything clear for the next day's arrivals. An hour after the sale detailed telegraphic advice is in California, and the grower knows on the same day the price brought by his fruit. The cars are furnished with improved systems of refrigeration during the summer months, each car having a capacity of from 8,000 to 12,000 pounds of ice; this is renewed three or four times in transit by the agents of the shippers, who are placed at regular stations. A car holds 1,000 to 1,200 half crates of peaches, plums, apricots or grapes, each weighing from twenty to twenty-five pounds; 450 to 500 boxes of pears, weighing from forty to fifty pounds, or 2,500 packages of cherries, weighing ten pounds each. The cost of bringing a car to New York is almost $400, with nearly $200 more added for ice. The journey is generally made in nine to eleven days, but owing to the reduction of the force on the railroads this year, and the interference to traffic by travel to the Columbian Exposition, the trains have been delayed from one to three days, to the injury of the fruit and the discouragement of California growers with respect to future shipments. Owing to its position, Chicago takes larger quantities of California fruit than New York. Boston also receives large direct shipments, while one or more cars of every train are diverted to such cities as Omaha, St. Louis, New Orleans, St. Paul, Minneapolis, Pittsburg and Buffalo.

During all this rapid growth of the consumption of California fruit in eastern cities, the supply from the orchards

and vineyards of the Atlantic coast has been steadily increasing in volume and improving in quality. Of course, the growth of population will account to some degree for the development of this business, but we must infer that Americans use fruit more generally and more largely every year.

New York. *M. C. B.*

Botanical Notes from Texas.—XII.

OUR ride from Pearsall to Laredo is more to the south than to the west. It is mainly through a plain region mantled over with the shrubs already mentioned in these Notes. In the valleys of the Frio, Leona and Nueces Rivers a larger growth is to be seen. In other favored localities Mezquit attains a size that allows it to be utilized as fuel, and the ringing of axes swung by Mexicans is heard breaking the monotonous stillness.

Rio Grande del Norte is only great as it is compared with the streams of the south-west. It is hardly equal to the Arkansas or to the Red River, yet for thousands of miles it will be, to some degree, a Nile to the millions of people who will inhabit its valley and utilize its waters for irrigation.

Laredo is a city of ten or fifteen thousand inhabitants. It is about midway between Kansas City and the city of Mexico, which cities are about two thousand miles apart. Laredo is situated in the valley of the Rio Grande, about half a degree south of the twenty-eighth parallel, and about the same distance west of the ninety-ninth meridian. It is a pleasant city to be in, the largest city in Texas, and the largest in the United States that lies so far south, unless it be Key West. The mean annual temperature of Laredo is said to be higher than that of any other city in the United States, excepting Fort Yuma. Just outside of the city limits on the north lies a long stretch of level bottom-land, which is now being utilized for vineyard purposes. The plat is irrigated by water raised by steam-power from the Rio Grande. Several hundred acres have already been planted in Grapes. The earliest-planted vines are now yielding their first fruits. The success of the enterprise appears to be well established, and Laredo may become renowned for the amount and quality of its grapes and wine. Last spring a car-load of grapes, raised about twenty-five miles south of the city, were shipped from Laredo to Chicago. They reached their destination about the 29th day of May. Grapes in northern markets in the month of May, ripened out-of-doors, marks an epoch in the history of Grape-culture in the United States.

From the immense fossil oyster deposits at the bottom of deep ravines and elsewhere near the city, it appears that this locality was well supplied with that bivalve long ago, when the waters of the ocean mingled here with the fresh water of the Rio Grande, or of some river which was its predecessor. There are extensive deposits of good coal along the river above the city. Opposite Laredo, across the Rio Grande, is Nuevo Laredo, a city of six to eight thousand inhabitants.

The river valley, and the higher ridges which mark its former banks, add to the general interest of this locality for botanical studies. The strange Larrea Mexicana is here on the hills, but is not so common or so large as it becomes farther north. When Nature set out to paint the leaves of this shrub she dipped her brush deeper into the yellow than into the blue pigment, and thus gave the leaves a dirty ochre color, by which the plant may readily be distinguished. How it came to have the sooty odor, which gives to it the common name of Creosote-bush, is not so easily determined. The whole plant is so resinous that it burns as readily green as dry. Its rather handsome small yellow flowers are succeeded by small hairy fruits. The Creosote-bush appears to be, in this state, at least, confined to the bluffs of the Rio Grande. Very common in richer soils near the river, and for a hundred miles or more eastward, is the odd-looking Kœberlinia spinosa. At first sight it appears to be only a bundle of thorns. On closer study we see that it is a real shrub, becoming at times a small tree. Its small leaves drop early. Its very numerous stunted branchlets all develop terminal thorns, upon which are borne clusters of numerous small yellowish flowers and the blackish fruits that succeed them. The simple imaginative piety of Mexicans has led them to believe that twigs of this shrub were used to form the crown of thorns which was placed upon the brow of the Saviour.

On slopes grows Parkinsonia Texana, with trifoliate leaves and flowers very like those of the Jerusalem Thorn. It is more strongly armed than any other of its Texas congeners. A Krameria, with handsome light purple flowers and the characteristic fruit of the genus, is often to be seen, even in the most arid places. Unfortunately, my visit to Laredo was made at the time when the long-continued drought was at its height, and so all that was eatable and within their reach had been taken by the numerous flocks of goats. But, though all the specimens of the plants that I saw had been closely pruned by them, it was plainly to be seen that one species was K. ramosissima.

The low-growing Lantana involucrata, with handsome maroon flowers, is common along fences and around brush piles. Rivinia lævis, named after the German botanist who lived more than two centuries ago, is a relative of Phytolacca (Poke) and grows everywhere in southern Texas, in shaded places. Its spikes of handsome red berries are more attractive than its purplish flowers.

One of the most conspicuous plant-sights in the south-west is Agave Americana, the well-known Century-plant of eastern conservatories. It is a native of the lower Rio Grande region, extending far south-westward. This most remarkable member of the Daffodil family has been almost venerated from the mistaken belief that it blossomed only once in a century. The species is monocarpic, but whether it blossoms in ten years or in twenty, or in more or in less years, depends upon the degree of prosperity which it has enjoyed. In the south-west the species is chiefly remarkable for being the original source of the principal intoxicants of Mexicans, and to some extent that of their nearer eastern neighbors. The juice of our plant is used in three conditions as a drink—as it comes uncharged from the plant, when it is like sweet cider; the juice, when fermented, known as pulque; and mescal, which is obtained by distillation from pulque. Like cider-brandy, mescal, when new, is a hot liquor, with a rank and peculiar odor. A drink or two of it will make the commonly staid and silent Mexican completely wild. When mellowed by age, mescal becomes milder and more pleasant, and is, perhaps, the most innocent liquor which people of the Rio Grande valley can procure, except their native wine and brandy.

Varilla Texana, a queer south-western composite, is abundant from about the ninety-ninth meridian, westward. It is a woody plant, low-growing, and forming clumps sometimes two feet across. Its very numerous leaves, which are confined to the lower part of the stem, are about an inch long, rounded and succulent. The leafless upper portion of the stem, or the peduncle, is from six to ten inches long, bearing a solitary rather small head of rayless yellow flowers.

Forms are constantly changing. But it would be interesting to know how the species of a genus, and the genera of an order, have come to differ so widely. We can readily see that an annual plant, removing to a more arid and hotter country, would soon learn that a development of wood-tissue in its roots and stem was almost a necessity to its changed condition of life. We can understand how Thallophytes, how even coast forms of inland species, thicken their leaves and stems under the influence of the salt-laden breezes of ocean. We would like to know how Varilla came to differentiate so widely from Helianthus, from Pterocaulon, Perezia, Arctium, and from Bellis. How the original typical composite itself, with its wonderful sporting powers, came into existence, from some antecedent, more general form. By what lapses of time, changes in conditions of climates and soils, and by what process of hybridizing, and crossing and bud variation, it has been enabled to outstrip all its competitors in the struggle for supremacy in the vegetable kingdom, and to become by far the most numerous, progressive and highly specialized family of plants.

A little way east of Laredo I found what is probably Perezia nana, though its pappus is tawny. Notwithstanding the drought at Laredo, one of the most disastrous on record, yet I found many plants in blossom and literally wasting their fragrance on the desert air. Thousands of Chilopsis saligna were displaying their handsome purple or white flowers on the bluffs of the river, while its neighbor, Leucophyllum, usually a summer bloomer, was taking a rest. Flourensia was also in blossom, a species of Brickellia, and a little Pectis and two handsome species of Hoffmanseggia.

San Marcos. *E. N. Plank.*

The Use of the Generic Name Halesia.

STEPHEN HALES (1677–1761) was a clergyman of Teddington, England, and a pioneer in observations on plant physiology. His *Statical Essays*, the first volume of which treats of "Vegetable staticks, or an account of some statickal experiments on the sap of vegetables," was published in London in 1827. The work passed through three

editions, and is one of the most noteworthy philosophical books of the time. It is not strange, then, that his name was associated with plants. Two genera were named in his honor. The first of these was proposed by Patrick Browne (*Civ. and Nat. Hist. Jamaica*, p. 205, pl. 20, f. i., 1755). The second was named by John Ellis, and published by Linnæus (*Syst. Nat.*, Ed. x., p. 1044; 1759), and is the one which stands in recent writings for the beautiful Silver-bell-trees of south-eastern North America.

Browne's Halesia is based on a West Indian tree now referred to Guettarda, L., which genus was established by Linnæus in 1753 on a Javan species.

It will be seen that the publication of Halesia, Browne, antedates that of Halesia, Ellis, by four years, and that the latter is thus a homonyn. According to the principles of nomenclature adopted by the botanists of the American Association for the Advancement of Science, the later name cannot stand, whether the earlier one does or does not, and this being the case, I take advantage of the circumstances and opportunity to dedicate this beautiful genus to Dr. Charles Mohr, of Mobile, Alabama, who is more thoroughly conversant with our southern forests than any one else of the present day, and who has contributed most largely to our knowledge of the flora of his adopted state, under the name Mohria.

The genus, so far as known, is purely North American, and consists of three species. The Japanese and Chinese trees of the genus Pterostyrax, Sieb. & Zucc., were referred to it by Bentham and Hooker, but the validity of this genus is maintained by Asa Gray and by Franchet and Savatier, and an examination of two of the Asiatic species has convinced me that this position is the more satisfactory.

The species will stand as follows:

1. Mohria Carolina (L.)
   Halesia Carolina, L., *Syst. Nat.*, Ed. 10, 1044 (1759).
   Halesia tetraptera, L., *Sp. Pl.*, Ed. 2, 636 (1762).
2. Mohria diptera (L.)
   Halesia diptera, L., *Sp. Pl.*, Ed. 2, 636 (1762).
3. Mohria parviflora (Michx.)
   Halesia parviflora, Michx., *Fl. Bor. Amer.*, 2, 40 (1803).

Columbia College, New York. *N. L. Britton.*

The Water-garden at Clifton, New Jersey.

LAST year Garden and Forest contained an illustration of Mr. S. C. Nash's water-garden at Clifton, New Jersey, and the accompanying article explained how an unkempt swamp had been converted into a scene of beauty. This season the special improvement has been the addition of a new tank, especially adapted to the cultivation of the Victoria regia, which plant has a special fascination for Mr. Nash. The old tank, being formed of sheet piling, was not sufficiently water-tight, and under some conditions the plants could not be sufficiently controlled.

A new tank was built early this year on one of the banks of the swamp. This tank is about two feet deep, and the bottom and its sloping inner sides are covered with eight inches of cement concrete. In suitable places there are four deeper depressions, eight feet square, formed especially for the Victorias. The tank is irregular in outline, one hundred feet long and fifty feet wide in its greatest dimensions. Its edges are, for the most part, concealed by plantings of Sedges, Ferns and broad-leaved plants, growing often among boulders agreeably disposed.

The plantings were made early this year, and they quickly became a charming foil to the Nymphæas. The narrowest part of the tank is spanned by a neat rustic bridge, which will ultimately be masked by vines. The whole effect, with the wonderful leaves and flowers of the Victoria regia, contrasting with the bright tropical Nymphæas and various aquatic plants mirrored in the clear pool and bordered by the careless profusion of attractive sub-aquatics and other suitable plants, are most picturesque. The glory of the tanks has been the four specimens of Victoria regia in vigorous health, one of which is represented in the illustration (p. 435).

This plant is justly considered one of the most interesting wonders of plant-life. It was first described by the botanist Schomburgk, who discovered it in British Guiana in 1838. It was first flowered at Chatsworth in 1849, from seeds gathered on the Amazon, among whose shallow affluents the plant seems well distributed. There are two forms in cultivation, Mr. Rand having found a variety with whiter flowers and less robust than the type. Besides being a wonder, the Victoria regia is somewhat of a luxury, as it is an expensive plant to grow, either under glass or in the open. It has been flowered successfully south of this in the open, without artificial heat, but under such conditions success is by no means a matter of certainty, except, possibly, in the lower southern states, as it is an essential condition of success that the temperature of the water in which the plants are growing should be kept at a minimum of eighty degrees. Mr. Nash's tank is furnished with two-inch pipes connected with a greenhouse heater, occupying a small house at a lower level. By the aid of the hot-water flow from this the tank can be maintained at the desired temperature in all conditions of summer temperature. Seeds of the Victoria, which are always kept under water and warm, are sown in a greenhouse in March or April and the plants transferred to their permanent quarters in May, at which time their special pits are covered with a glazed frame, which is maintained till the weather becomes genial in June. The first leaves which appear lie flat on the water and remain so till they decay. As the plant gains in vigor the leaves begin to show at first a mere suggestion of rims, while the next ones are likely to show a square edge half an inch or so high. As the plant gains its full maturity, perfect rims are unfolded six to eight inches high and completely encircling the leaf. The illustration shows an unfolding strong leaf about two days above water. This is an uncanny object, bristling with spines, clearly showing its prominent ribs, and dark reddish brown in color. The mature leaf is light green above and has a surprisingly graceful effect as it floats on the water. It is rather thin in texture, the strength to uphold a burden of sixty or seventy pounds being given by a network of numerous girder-like hollow veins which cover the under surface and extend in diminished size up the rim, where a touch of red blends with the green to add to the attractiveness of the leaf. A tank-like leaf, such as this, would be quickly filled by a heavy shower if it were as close as it seems, but it is furnished with numerous small ducts, through which the water escapes from the surface as fast as it falls.

The flowers of the Victoria would seem more of a marvel were they not so overshadowed in size by the six-foot leaves. They are usually a foot or more in diameter, with numerous strap-shaped petals, which are pure white as they open first in the late afternoon. They close the next morning, and open again in the afternoon with a rosy hue, which gradually deepens into purple, with which their glory departs. Strong plants show new flowers at intervals of from three to five days. The seed is freely produced in an ovary protected on the outside by stiff cruel spines and a cap of gizzard-like texture. In early September the tank also contained a good specimen of Euryale ferox, which ranks only second to Victoria regia in size. The large leaves have a firmer texture, and are profusely veined, but without rims. All the tropical Nymphæas, of course, grow into fine specimens, in this tank there being large plants of N. Sturtevantii and of varieties of N. Zanzibarensis. Even the hardy Water-lilies, at the time of my visit, did not seem averse to a little extra heat, and pieces of N. Laydekeri, N. sulfurea and N. Mexicana were in fine condition, while Nelumbium speciosum was showing the thriftiness usual to it in any position. The main garden was in its usual flourishing state, the weeds having been quite mastered, and the aquatic plants making large masses.

Elizabeth, N. J. *J. N. Gerard.*

Cultural Department.

Cauliflower for Winter-forcing.

COMPARATIVELY little has been written about forcing vegetables in this country, and since the Cauliflower is not grown to any extent under glass, except in private establishments, this vegetable has been specially neglected, although it can undoubtedly be forced with profit. We are glad, therefore, that a late bulletin of the Cornell Experiment Station gives an account, both of success and failure, with this vegetable during three years of practice. The following are the chief points recorded in the bulletin :

In the winter of 1890–91 seeds were sown in flats and the seedlings transplanted into pots. They had reached a height of ten inches when they were set in eight-inch pots, which were placed on the ground in a cool-house where the temperature often went below forty degrees. Although the Cauliflower likes a low temperature, the plants soon suffered, evidently on account of the cold and wet weather. Removal to an intermediate temperature started growth again and small heads began to form again before the plants had reached a proper size. The heads, however, split or "buttoned," being ruptured by the sudden stimulus of a new growth after the plants had been checked.

The next winter plants were kept in a uniform condition of vigor throughout their lifetime and the attempt was successful, but they were grown in six-inch pots and the plan proved too expensive. Last winter Cauliflower was grown in a low two-third span facing the south, sixty feet long by twenty wide. The house is on a hill-side and it has three benches, the two lower ones being used for the Cauliflower. The one against the south wall has a board bottom underneath eight inches of soil and is supplied with mild bottom-heat from two one-and-one-quarter-inch steam pipes. The central bench, seven feet wide, has a solid ground bed with no bottom-heat, its eight inches of soil resting on natural subsoil of hard clay. This soil is good garden loam, mixed with well-rotted manure in the proportion of three or four to one. Sand is added to afford good drainage and to prevent the somewhat pasty mass from becoming sour. The plants which had bottom-heat did not succeed. They were later and smaller than those in the middle bed, and so few good heads were formed that they did not pay for the labor expended upon them. The seeds of three varieties were sown on August 24th, and having been once transplanted were set in the beds on the 4th of October, about sixteen inches apart each way. The plants were given water as it was needed and the ground was frequently stirred. Abundant air was given from ventilators, even in sharp weather if the sun was bright, and from sixty to seventy degrees, Fahrenheit, in the day-time and about fifty at night were considered the proper temperature, although on bright days the mercury registered eighty degrees occasionally for a short time and the night temperature dropped occasionally below forty. The fresh air and precautions against overwatering seemed to check a tendency of the plants to damp off, which appeared when they were set out, and the few vacancies were filled with new ones. The aphis was kept in check by tobacco-smoke, and the cabbage-worms, which were first noticed late in November, had to be carefully picked off for a couple of weeks.

Fig. 65.—Victoria regia in Clifton, New Jersey.—See page 434.

The boxes of young plants stood out-of-doors during September, and it was probable that the eggs were laid upon the plants at that time. Heads began to form early in December, and on the 13th of January, four and a half months from the seed, the first ones were ready to sell. The Erfurt was earliest, and as the house was needed for other experiments the plants were removed on the 20th of January. At this time nearly three-fourths of the crop had matured sufficiently to give marketable heads, although many of them were small. Like all forced crops, winter cauliflower should be sold when small, for products of medium size or smaller will sell for quite as much as large ones in winter, and the cost of raising them is less.

Heads four inches across sold in January at the door for twenty cents each. On the 25th of January a second crop of early Snowball and Dwarf Erfurt plants was set in the beds from seed sown on the 21st of October. On the 20th of March heads were formed on early Snowball, and a week later some plants had heads three to four inches in diameter, while the Erfurt plants showed none. The first heads sold on the 29th of March, five and one-third months from the date of sowing, a little longer interval than in the case of the first crop, because the later plants were grown in the dark, short days of midwinter. The climate of Ithaca, too, is excessively cloudy, and the forcing of plants presents special difficulties there. Owing to dark weather, and, perhaps, to mismanagement, many of the heads in the first crop had begun to button or break into irregular portions, with a tendency to go to seed when the plants were removed. An attempt was now made to keep them at a uniform, but not an exuberant growth, to prevent this trouble. The crop held well till the first of May, when the experiment closed and there were many merchantable heads still left. Ninety per cent. of the plants made good heads, which is a large proportion for even the best field-culture. They were allowed to attain a size of six inches, which is larger than the midwinter crop. It is rarely necessary to bleach the head of a Snowball cauliflower, although late in April it may be necessary to break a leaf down over the head now and then to protect it from too hot sun, but generally they will be perfectly white under glass when full-grown. The plants were grown under a single-thick, third-quality glass, and the heads were as sweet and tender as the very best field product. Altogether, no crop grown under glass at the station, of vegetables or flowers, was so satisfactory or attracted so much attention as these crops of cauliflower.

As to varieties, there is little choice between the Erfurt and Snowball strains. In the most successful crop the Snowball was earlier, but otherwise it had little, if any, superiority. The attempt to grow Lettuce between the Cauliflowers was unsuccessful, but the two borders of the beds give good crops of Chinese mustard, which makes delicious greens in winter.

The sum of the matter seems to be about this: Cauliflowers can be grown easily as a winter crop if they are kept in vigorous and uniform growth. They need a rich soil, with careful attention to watering, cultivation and ventilation, and a cool temperature like that employed for Lettuce. They need no bottom-heat. They should be set in beds when from six weeks to three months old, according to the season, and heads will be fit for market in from four to five months. The heads require no bleaching, and are ready for sale when from four to six inches in diameter.

Mushrooms.

THERE are few gardens containing special arrangements for the culture of Mushrooms, as caves and houses specially built for this purpose are not often seen. But places that are suitable for the production of a crop without any expenditure, except for the material and labor, are quite common in almost every garden where the greenhouses are built on the modern plan with benches or stages in the interior. We have a house wherein are two centre benches of Chrysanthemums; the benches are about three feet from the ground, and under these is the natural soil or gravel floor. By placing hemlock-boards on edge against the legs of the benches we have at once as good a Mushroom-bed as can be desired, and hitherto have not failed of a crop. One cart-load of manure is available a week, and this is spread out-of-doors to dry, and is turned over every day once or twice. At night it is heaped up and shutters are placed over it in case of rain, and in a week it is dry enough to make into beds indoors. I like to have it so dry that the hands are not soiled by contact, and that it does not contain moisture enough to cause it to stick to the bricks used to make the beds firm. The old-time plan of mixing loam with the manure is a good one, especially if a heap of perfectly dry loam is prepared and covered up during summer. The loam will then act first as an absorbent of ammonia, and, besides this, as a regulator of the heat of the newly made beds, for whenever a bed heats violently—say, over 100 degrees, Fahrenheit—the heat is rarely sustained as long as desirable to promote a healthy spreading of the mycelium, or spawn, through the bed, without which there cannot, of course, be any success. As soon as it is certain that the heat will not be violent we plant the spawn and cover with loam when the heat is on the decline, and if the temperature of the bed is still decreasing about six inches of hay is put on as a covering. This brings the heat up again through the spawn to the surface of the bed. Our first-made beds stand now at eighty-five degrees, and will not vary more than five degrees until the crop appears.

After the first crop is gathered a good soaking of manure-water is applied—that from the cow-barn is best—and we get a second and sometimes a third crop from the beds before the warm days of spring make it too hot a place for success. It should be stated that the minimum temperature of the house is fifty degrees, and fire-heat is rarely used until the Chrysanthemum-buds begin to show color; after these are past, Violets are grown in the same benches with hybrid Roses, for spring flowering, the side tables being occupied with Pinks permanently.

I fear we are too liable to blame the spawn for lack of success, for there are many other causes of failure, only to be found out by careful watching. Scarcely any two growers agree in the minutiæ of their practice, and there certainly seems to be no royal road to assured success. Each season we gather a quantity of the very best Mushrooms from a bench containing Mignonette. We have gathered there already and shall continue to do so, more or less, all winter. The soil in the benches is twelve inches deep and is made very rich; the material from an old bed is mixed in at the time of putting in the soil, the last week in July, and manure-water is used just as soon as the Mignonette is ready to cut. This season we have spawned a portion of the Mignonette-bed to see how this will result. The cool, moist bed of soil in which the Mignonette grows seems just suited to the development of the best Mushrooms, but it must be remembered that the spawn runs during the period of warm weather, when the bed is not kept so moist as it is later, when the Mignonette requires frequent watering.

South Lancaster, Mass. *E. O. Orpet.*

Noteworthy Late-flowering Shrubs.

GOOD late autumn-flowering shrubs, hardy enough to live out-of-doors in winter, are few and much to be desired in northern gardens. In fact, those generally known, and which normally produce their bloom in October, exceed hardly a half-dozen in number. There are, however, a considerable number of species which, while they properly blossom much earlier in the season, persist in producing flowers on new growths of wood, until finally checked by frosts.

Among the true autumn-flowering woody plants there are none so common in many parts of our country, and yet generally so little known and appreciated, as our native Witch-hazel, Hamamelis Virginiana. Different plants, even in the same locality, vary greatly in the time of flowering, so that the little clusters of buds may be found opening and the narrow, long, pale yellow petals expanding during September and October, and well into the month of November, if the season is favorable in this latitude. There is considerable variation among these plants, in the size and abundance of bloom as well as in the time of flowering, and some particularly fine or free-blooming forms might be profitably selected for cultivation and propagation. The Witch-hazel will grow well in any ordinary soil and does not require unusual moisture, as is commonly supposed. It is of a rather straggling habit of growth, and where it abounds naturally it may, therefore, be enjoyed in its native haunts; but where it is less common it is interesting enough to have a corner in the garden. In autumn the foliage gradually fades from green to a pale yellow color.

Alders usually blossom in early spring, but the sea-side Alder, Alnus maritima, is an exception to this rule, as it produces its slender male catkins in the autumn, or in the latter part of September, in this latitude. It is a rather rare plant, and does not possess any particular value for cultivation, except for its unusual time of flowering.

Though by no means what is called a hardy plant, an exceedingly interesting and beautiful one throughout the

autumn, is the little southern tree known as the Franklinia, Gordonia Altamaha, also found in trade catalogues under the name of Gordonia pubescens. At Philadelphia or Washington the climate allows this plant to attain to the stature of a small tree; but at the Arboretum, after growing in its present position for about eight years, it is a several-stemmed shrub eight or ten feet high. Moreover, it is necessary every autumn here to bend its stems over, to as near the ground as possible, and protect them from the rigors of winter with leaves, soil or other protecting material. After pegging the branches down, the best protection is afforded by putting dry leaves over and among them, and then covering the whole with soil thrown up in the form of a little mound, so as to shed the rains. It might pass the winters without such protection if planted in the shelter of some warm walls. In any case, it is well worth any extra care bestowed upon it. The large, dark, evergreen-looking foliage is always handsome, but it is the large, globular or pear-shaped buds and blossoms which are the reward of the painstaking cultivator. These are pure white, and composed of five broad incurved petals, surrounding and enclosing a great number of yellow stamens and anthers. They never open very widely, like a rose, but at full bloom maintain a seemingly half-expanded position. The odor is delicate and sweet and suggestive of tea, and, indeed, this Gordonia, or Franklinia, is about the nearest American representative we have of the Tea-plant of the Orient. The blossoms begin to open in September, and are continuously produced, a few at a time, until the growing, unripe twigs and buds are destroyed by frosts.

Although this is a distinctly American plant, having been found near Fort Barrington, on the Altamaha River, in Georgia, in the last century, it is not now known anywhere in a wild state, and the plants in cultivation are the descendants of those collected by early botanical explorers in the south. It may be propagated readily by layers or cuttings. In common with the Witch-hazel, the Franklinia has the unusual habit of not maturing its fruit until the next autumn, when it is again in bloom.

Although it is long since Caryopteris Mastacanthus was first introduced into cultivation, this beautiful little plant is rarely found in gardens. It is a smooth, branchy little shrub, having much the habit of a Ceanothus or Callicarpa, to which latter family it is allied. C. Mastacanthus does not appear to be truly hardy in this latitude, although it has not been fairly tested out-of-doors with a proper winter covering. But it blossoms so late and so profusely, and is altogether so attractive, that it is well worth the trouble to lift it in autumn and place it in a pit or cold frame, and to replant it again in the spring. There are dry, sunny, sheltered spots even about Boston where it might possibly live and thrive without removal in winter. The flowers, which are individually small, are borne in close corymb or umbel-like clusters in the axils of the opposite leaves and on all the branches. Blossoming begins in September, and as the twigs continue to grow, new flower-buds are produced with each new pair of leaves, until further growth is checked by cold weather and frosts. The blossoms are of a rich violet or lavender-blue color, and have a slight aromatic fragrance. The foliage, green above, is soft, downy and hoary white beneath, and when bruised it gives out a very powerful, pungent, aromatic odor strongly suggestive of some plants of the Mint family, although this plant is generally classed in the Verbena family. It may be readily propagated by cuttings.

Jamaica Plain, Mass. *J. G. Jack.*

Notes from a Northern Garden.

Zephyranthes concolor, a Mexican species, which flowers in July, is a shy bloomer here. Out of over a hundred apparently strong, healthy bulbs only two flowered. It is a pity if this is its general habit, for it is one of the most beautiful species. The flower is of good size—an inch and a half wide—of a delicate creamy yellow, shaded with green outside. Its numerous leaves are a foot or more in length by half an inch wide, slightly glaucous and nearly erect.

Œnothera Missouriensis, now in flower from seed sown last May, is an attractive and free-blooming species with light lemon-yellow flowers, quite conspicuous. The plant is low in habit, about six inches high, and the flowers, not rarely four or five inches wide, on stems about six inches in length. It likes full sunlight, a sandy or gravelly soil and good drainage.

Lepachys columnaris has been in flower for more than a month from seed sown in May. It is a desirable plant. The typical species, with plain yellow rays, is pretty enough, but the variety Pulcherrima is by far the most striking. It grows about two feet high, branching from the bottom. The columnar disk is often over an inch in length by half as thick at the base. The large drooping rays, five in number, are from one to one and a half inches in length and nearly as wide. The inner portion of each ray is brown-purple, with a yellow space outside. The flowers are very durable and the stems of good length for cutting.

Charlotte, Vt. *F. H. H.*

Roses.

THE outdoor Rose season is now almost at an end, excepting in some favored localities where the plants have been protected from the early frost. Prominent among the varieties that have added to their established reputation is the old favorite, La France, which is decidedly one of the best summer Roses we have, either under glass or outdoors. While it sometimes loses a portion of its wood during severe winters, even in the latitude of Philadelphia, yet it is usually satisfactory, and I have seen good flowers on La France outdoors within two weeks (October 9th), and on plants that have been flowering freely through nearly the whole season.

Marie Guillot is another well-known sort that gives satisfaction in this locality, its firm and full flowers being admirable for cutting, and it is also a continuous bloomer. Papa Gontier also does well, making strong growth with peculiarly attractive foliage and very highly colored buds outdoors in the full sunshine. But this Rose, having but few petals, is necessarily best in the bud state, and should be cut early in the morning before the flowers expand too much.

Hermosa is another general favorite in this locality, for although its blooms are not large, the color is pleasing, and it probably deserves the designation of ever-blooming more than many other varieties to which it has been applied. That pretty little Polyantha, Clothilde Soupert, is about the best of its class at present. It shows much power to withstand drought and other disadvantages, and can scarcely be found without flowers. I have noted this variety during the past summer, both in this locality and also in the parks and gardens of Chicago and St. Louis, and while the latter cities are both quite trying to outdoor Roses, it comes through hardships in better condition than most other varieties, and gives a good effect when massed in a bed.

Dinsmore is also a good bedding Rose, free in growth and bearing abundant flowers of very bright color. Marie Van Houtte should not be omitted in the list of outdoor Roses, as it is one of the finest Teas for this purpose, giving an abundance of good-sized flowers all through the season, the yellowish white of its flowers being pleasantly relieved by the pink tinting of the outer petals. Perle des Jardins endured a temperature of twelve degrees below zero here last winter, and though somewhat crippled by the loss of a considerable portion of its wood, it recovered sufficiently to produce a few fairly good flowers during the summer. It is quite probable, however, that this variety would be entirely winter-killed a few degrees further north than this, and it cannot, therefore, be safely recommended as a hardy Rose.

Among the hybrid Perpetuals, General Jacqueminot continues a favorite in this locality, being of such an excellent constitution that a crop of flowers can generally be depended on, and frequently another, though lighter, crop in the fall. Paul Meyron is another reliable sort, and though its very large flowers are not so gracefully formed as those of some other varieties, yet their color is pleasing, and they add much to the beauty of the garden. Mrs. John Laing and Mademoiselle Gabrielle Luizet are as satisfactory for outdoor use in most localities as they are for indoor forcing, thus proving their general value, and Ulrich Brunner and John Hopper are also first-class sorts for the garden, the latter being less common than it merits of late years.

Holmesburg, Pa. *W. H. Taplin.*

The Vegetable-garden.

HARD frost may be expected now, and with it will come the work of cleaning up the vegetable-garden of the plants of Tomatoes, Beans, Corn and other tender vegetables. Root crops and vegetables generally of the Brassica family will stand much longer, often making the best part of their growth during the cool autumn. Raspberry-canes out of bearing may be cut away, and enough of this year's canes selected for next season. Although some varieties, notably the Cuthbert and almost all the black-fruited sorts, will generally endure the winter unprotected, they are occasionally injured, and it is safer to lay them down and give them some protection.

Batches of Lettuce and Endive may be stored in frames where they can be protected with sashes, an abundance of sunlight and air being given them on every fine day. With

care these can be kept well through the winter. What is not wanted until spring may be allowed to freeze, and then be covered with a few inches of leaves. If brought to the light and air gradually, and thawed out slowly, they will appear as fresh as when closed in. Batavian Endive should be packed quite closely in the frames, so as to bleach well, and it is customary to tie up a few heads for early use. Cauliflowers not yet headed will close in nicely if taken up carefully and stored in sand in a light pit, and will keep well through the winter. From a lot of the Autumn Giant variety we cut some fine heads last February. Brussels Sprouts, Scotch Kale and Cabbages of all kinds come up fresh and clean if stored in this way, which is much better than earthing them up out-of-doors. We keep Celery in the same way, except that the stalks are put in close rows, care being taken to get all of the roots and to take off all useless leaves, and a layer of sand is used between each row for bleaching, and well up to the leaves. Turnips, Carrots, Beets, Salsify, Parsnips and Leeks—in fact, all root crops—are buried in moist sand, where they can be conveniently got at, and these come out fresh and crisp.

Constant surface cultivation is the ruin of old gardens. Routine should include the trenching of a part of the garden every autumn, the whole of it being treated in this way in four or five years. When practicable, sections of the garden should be given a rest by sowing and plowing in a crop of Clover. Worn-out ground may also be renewed with lime and salt, alternately, and there is no better time than this for putting it on.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

The Winter Care of Water-lilies.

To the Editor of Garden and Forest:

Sir,—In your issue of September 27th, Mr. Tricker alludes to his method of wintering Water-lilies. Perhaps he would be kind enough to give the details of his practice.

Madison, N. J. *J.*

[In the first place, one not familiar with the different varieties should carefully identify those in his possession, and should know whether they are hardy or tender. This can generally be ascertained by referring to a descriptive catalogue of aquatics. At this season the tender varieties call for our immediate attention. Such plants as are grown in tubs can readily be taken from the tanks or basins and placed in a greenhouse; the largest leaves that cannot be placed on the surface of the tub may be cut off; the tubs should be set where they will receive a fair amount of light, and should be kept filled with water. There should be no haste in drying off the plants, since the decreasing light and temperature will allow the plants to rest naturally. Such varieties as Nymphæa Devoniensis, N. dentata and others of the Lotus type will form tubers around the old root as the plant dies off, which should be carefully looked after and put into pots of sand or moss, and kept moist and in a moderate temperature. The tubs can be emptied and stored away. These tubers will keep sound and good until April, when if planted, covered with water and subjected to a higher temperature, they will make strong plants to put out again the following June. The case is not the same with Nymphæa Zanzibarensis or with the Stellata type. These do not form side tubers as the Lotus varieties do, and if the plants have grown large and strong, and have flowered freely during the past summer, the greater will be the risk and difficulty in keeping them over. Under the same conditions as the Lotus varieties they retain their foliage a much longer period, provided they have not received a chill or violent check; otherwise they will rot. These should be kept in tubs filled up with water as long as they retain live green foliage. If new leaves appear you will doubtless find, as the season advances, that the plants will show signs of active growth and give assurance that they will live on and take their places again another summer. Plants grown in large pots or boxes can more readily be taken and placed in tubs or half-barrels of water, and kept under the same condition as above mentioned.

The hardy varieties if planted out will be best left alone, provided there is sufficient water above the crowns of the plants, so that frost cannot reach them. Where the native Nymphæas will grow, other so-called hardy varieties will survive under the same conditions. In shallow tanks, where there is danger of the masonry being broken by the frost, this should be covered with branches, leaves or salt-hay after cold weather sets in. This is preferable to taking the tubs out and storing in a cool cellar or other building, for, keep the plants as cool as we may, it is very difficult to hold them back in the spring, and by the time the tank is ready to receive them the plants will have made considerable growth, which is very apt to get cut off, and give them some check. This will not happen to plants left out all winter in the tank. Where the winters are not severe, and not more than twelve to fifteen inches of ice are formed, it is not necessary to cover tanks all over if they are more than twelve feet in diameter. Branches of trees and salt-hay on the rim are sufficient to save the masonry, which is all that is necessary. Plants grown in tubs, and not submerged during the summer season, must of necessity be wintered in cellars or other buildings. A good covering of sphagnum-moss will help to keep the plants in a uniform condition and retard growth in spring.—*W. T.*]

Mildews as Influenced by Climate and Variety.

To the Editor of Garden and Forest:

Sir,—One of the vital questions connected with Grape-culture in North America is how to control its diseases. Destructive fungi prevail everywhere, but some of them are more abundant on the Atlantic coast than in the north-west. Thus, black-rot, Læstedia Bidwellii, is much more abundant from New York to Virginia than it is in the states of Iowa, Minnesota and Illinois. In the west we are especially troubled with downy mildew, Plasmopara viticola, and powdery mildew, Uncinula necator.

I have carefully watched these diseases since 1889 in central Iowa, and am prepared to say that climatic conditions bear a very important relation to these mildews. We had some exceptional weather during the seasons of 1892 and 1893. The seasons of 1889, 1890 and 1891 were exceptionally dry. The precipitation occurred at intervals during the entire summer, but the rainfall was not abundant. During the present season and in 1892 we had not only frequent rains, but the precipitation was large during the months of May, June and part of July. We had scarcely any rain in August and September. So far as the mildews are concerned, the month of September may be left out of account, as the leaves are so far advanced and the grapes so nearly mature that the fungus can do little injury.

We observed little injury from downy mildew during the comparatively dry years. In fact, the fungus appeared more commonly during the month of August. When not abundant it hastens the maturity of the leaves, as they are very numerous on cultivated forms of Vitis labruscæ and V. riparia. The case, however, is very different in years like the present. The numerous rains in June and July brought on an abundance of mildew. So common has it been this year that varieties like the Concord and Worden, which, as a rule, are not affected severely here, were much injured. This was especially noticeable in places where the vines were in low grounds. I know of one vineyard, partly on low ground, and the leaves here were more badly mildewed than they were on the upland vines. Looking over a large number of varieties of cultivated Grapes on the College-grounds, I find that the following varieties have suffered severely from this disease: Jessica, Carlotta, Beauty, Noah, Missouri Riseling. The leaves had fallen by the 1st of September, and two-thirds of the grapes were dried and shriveled. As a result none of these grapes have ripened properly. It is especially worthy of note that at no time since 1889 have the Rogers hybrids been severely affected with this mildew. I have not seen a leaf affected this year, when Concord-vines near by were badly diseased. From my observations I am inclined to believe that, for their greatest development, the Peronosporeæ require considerable moisture.

With the powdery mildews moisture is not so important. It is rarely common to find them on grape well developed before August, and the powdery mildews in general are not in such profusion early in the season as later. We always get them in abundance for class-work in August. The powdery mildew of the grape is abundant on the Rogers hybrids, like Agawam and Salem. On these varieties it develops somewhat earlier

than on the Concord and Worden. The cultivated forms of Vitis riparia are quite free from this mildew. The Worden and Concord both show it in considerable quantity every year, but, as a rule, it is not so general over the vineyard.

Iowa Agricultural College, Ames. *L. H. Pammel.*

Tecoma Mackenii.

To the Editor of GARDEN AND FOREST:

Sir,—I note Mr. W. Watson's remarks in a recent number of GARDEN AND FOREST regarding the flowering of Tecoma Mackenii at Kew, and perhaps our experience with this plant in southern California may not be without interest. It was introduced here about five years ago, but was little known until recently, and even now it is not common by any means; with us it requires a great deal of room, and the hottest and sunniest position possible, otherwise it appears to be a shy bloomer. I know it in some gardens where it is slightly shaded by trees, and yet after three years' growth, with rambling branches fifteen feet long, it still fails to flower. Against sidings, or on the tops of arbors where the refracted heat in summer is almost intolerable, it flowers freely enough in midsummer, and is certainly a beautiful and desirable plant.

Los Angeles, Calif. *J. C. Harvey.*

Recent Publications.

The Protection of Woodlands Against Dangers Resulting from Organic and Inorganic Causes. By Hermann Fürst. New York: Wm. R. Jenkins.

This book is a translation by Dr. John Nesbit, of the Indian Forest Service, of a work written by Dr. Hermann Fürst, director of a Bavarian forest-institute. Its title shows the scope of the book, which embraces a most essential part of forestry, and it is well worth the study of American readers, although, from the nature of things, the dangers which threaten the forests in this country are many of them quite different from those which need to be guarded against in Europe. The book was translated primarily for the readers in Great Britain; but, although American forest-owners are not likely to take the precautions here suggested against injuries by frost or damage by heat, it is, nevertheless, instructive for any one to read how such dangers are regarded, and how they are met in the countries where wood is valuable and where forest-property is looked upon as a permanent investment, and where there has grown up under these conditions a systematic forest-practice. The chapter on Forest Weeds, a term made to include herbaceous or shrubby plants which may become noxious by overtopping and interfering with the growth of young trees, contains much instruction that can be adapted to our own latitude, and in a general way the elaborate account of the fungal parasites which grow on or in trees and endanger their health can be made immediately useful, although the parasitic plants here differ widely from those in the Old World. Most interesting is the chapter on animals which are injurious to forests. It will require some severe schooling before our people will take note of the damage inflicted upon standing timber by small rodents like mice and squirrels, or, indeed, by animals of the chase like the deer and rabbit. But our woods, both public and private, are every day suffering from domestic animals which are turned out in them to graze on grass and weeds and the fruits of the trees. In Europe goats do the most injury, because they prefer the leaves, buds and young shoots of woody plants to grass weeds, even when this forage is more abundant. The destruction of the forests in many of the mountains of Tyrol, Switzerland, and Greece is attributable mainly to the grazing of goats, which has made it impossible to recover areas once cleared of forests. The destructive habits of these animals have lately been noted by our correspondent, Dr. Franceschi, who relates in *Zoe* how they are destroying the vegetation on Guadeloupe Island, off the coast of Lower California. Horses rank next to goats in destructiveness, for, although they prefer to graze on sward along wood-roads, they are yet fond of the young shoots of saplings and their leaves, and they can strip these to a considerable height. Young horses also love to gnaw bark, while their weight and their iron-shod hoofs increase their power to damage superficial roots by trampling. Sheep are ranked third in destructiveness, and cattle, although they do less damage comparatively, accomplish much harm in the long run, for although they decidedly prefer soil-grazing, and only attack fibrous growth when there is a dearth of grass, still they will browse on leaves and shoots when they are succulent, bend down strong saplings under their chests to get at the crown and injure trees by rubbing themselves against them. Besides this, they loosen by their weight and with their sharp feet the soil on slopes until it is easily dislodged and washed away, and stamp down the earth wherever they gather for the night.

The paragraphs relating to the injuries by birds, squirrels, tree-mice and game will be relished by any one who has a taste for natural history and is interested in the relation between plants and animals. Nearly half the book is taken up with descriptions of injurious insects and the remedies used against them. Of course, the most destructive forest-insects in Europe are not those which now give the most trouble in this country, and yet the general discussion on the life-history of various classes of insects, and of the influences which favor their increase, of the improved methods of general prevention and extermination, the different forms of injury which are inflicted on timber-crops and the proper way to treat such crops when damaged, all make instructive reading for forest-owners in any country. While the book cannot be commended as a practical treatise in all details for American foresters, it is, nevertheless, a thorough and conscientious work, one that arouses reflection, and is, therefore, worthy of careful reading by all who are interested in forest-practice. We quote a section on frost-shakes, which is of popular interest and will give an idea of the quality of the work:

In certain species of trees longitudinal fissures often appear on the older stems as the effect of hard frost. Beginning near the ground, these frost-shakes are sometimes only a yard or two long, but often extend into the crown and penetrate from the circumference sometimes to the very core of the stem. Although they do not interfere with the vital energy or growth of the tree, they decrease the value of the timber and sometimes afford a chance for the entrance of fungus spores into the stem, which bring on disease. These fissures are caused by the contraction of the wood which takes place during great cold, much in the way that timber contracts as water is withdrawn when it becomes seasoned. During severe cold, not only water in the elementary parts of the wood, but the water in the cell-walls, freezes and at the same time this is drawn into the interior of the cells, so that the substance of the walls is diminished and contracts, the contraction being greater tangentially than radially, and greater on the outside zones with their larger quantities of water than in the drier heart-wood. Whenever this shrinkage exceeds a given limit a sudden division of the woody tissue takes place in the direction of the medullary rays, and the formation of this frost-shake is accompanied by a loud noise.* As soon as the thaw follows the frost-shake the expansion begins, the fissure closes and is overgrown by a new annual zone the next summer, but it is usually opened again during the next winter even by a moderate degree of cold. If several mild winters pass without causing the fissure to re-open, the stem may assume the external appearance of being healed and may remain permanently closed. Along the edges of the cleft the formation of the new annual zone is always somewhat thicker than on the rest of the stem, and as these two cicatrized edges are close together they gradually form ridges or frost-scars standing about a hand-breadth from the normal outline of the stem.

Hardwoods with strongly developed medullary rays, like Oak, Elm and Sweet Chestnut, are chiefly exposed to the danger of forming frost-shakes, but they are formed less frequently in the Beech, in the Willow, the Poplar, the Lime and Conifers. They are usually found on the east and north-east side of the stems, as the harder frosts only set in when the wind comes from that direction. Preventive measures can hardly be used to mitigate this evil, but the early utilization of the trees with bad fissures is recommendable in view of their liability to fungoid disease and consequent depreciation in value.

* A similar noise is heard in the Bamboo forests of Burmah, where the wood splits in the hot months of March and April, on account of shrinkage from heat, and the halms burst with a report as loud as that from a pistol.

Notes.

One of the best decorative displays of dried plants at the World's Fair is a large lot of Algæ, shown by Miss M. J. Westfall, of Pacific Grove, California, in the scientific section of the Woman's Building. The seaweeds have been pressed on Bristol-board in such shape as to afford striking ornamental figures, while the value of the specimens for scientific study still remains. The most novel part of the collection are delicate brands of veiling fabric upon which the most fragile colored Algæ are permanently impressed, making a unique material for house-decoration.

Among the earliest Chrysanthemums in market is the variety Yellow Queen, which is a seedling raised by Mr. I. Forstermann, of Newtown, Long Island. Miss Kate Brown, which is also yellow, seems to be nearly as early. October Beauty seems too abundant already, while Miss Minnie Wannamaker, Domination, Gloriosum, Mrs. J. G. Whilldin and Mrs. J. N. Gerard are among the varieties most often seen. The Chrysanthemum season has fairly begun, as is testified by the number of these flowers which are seen in the button-holes of men on their way down-town to business.

At this season the persons who have taken pains to give the late-flowering Helianthus Maximilliani an abundance of rich food are enjoying a fine display of golden yellow flowers. This plant is perfectly hardy, but it seems to run out if confined to one place too long, and it should be moved to fresh feeding quarters every few years. It is a rank grower and needs abundant provender to make strong plants, standing from six to ten feet high, with their long stems closely set with flowers. Where there is room for large masses of these plants their effect at this time is one of the most striking which can be produced in the hardy-plant garden.

Among the bright things noted by visitors in Cenral Park just now are the New England Asters, which are flowering abundantly along the paths, the Norway Maples which have turned to an unusually clear lemon-yellow color, the bright scarlet of the Sumachs and Virginia Creeper, and the vivid crimson of the Japanese Ampelopsis on the rocks in Morningside Park. The Sugar Maples, Nyssas, Liquidambers and many other trees, whose foliage is usually bright at this season, are late in turning this year, and although the colors of our forest-trees in autumn are never as brilliant near the sea-coast as they are further inland, our parks for a fortnight to come will be conspicuously beautiful, especially as the grass is more thick and green now than it has been at all this year.

A correspondent of the *Gardeners' Chronicle* gives some notes on the cultivation of fruits not generally grown, which will be of interest to American readers. Some two years ago he obtained plants of the so-called Japanese Wine-berry, Rubus Phœnicolasius, from Mr. J. L. Childs, of Queens, Long Island, and these were planted in rich loamy soil. The second year they gave an abundant crop and were absolutely free from insects. The berries he finds as large as raspberries, enclosed in a hairy calyx until nearly mature, and borne in large clusters. The flavor of the berries is pronounced exceedingly agreeable and distinct from that of any other fruit known to the writer, and they proved excellent, whether eaten raw, cooked, or made into jam. The Dwarf June-berry was another fruit which he had tried, and, so far as he could judge, was well worth growing in England.

In some notes on Carnations, prepared by Mr. A. M. Herr for the last number of the *American Florist*, after the advantage of housing these plants as early as possible is explained, the chief point insisted on is that the greatest care in syringing and watering should be exercised, now that the days are shorter, the nights cooler, and the moisture slower to evaporate. To illustrate the difference in susceptibility to injury from overwatering, Mr. Herr cites Daybreak as a variety which is attacked by spot very readily if it is watered a little too much or a little too late in the day. while Lizzie McGowan can be syringed at almost any time without apparent bad effect. Plants which are set too deeply are liable to attacks by a fungus and will die off to the ground. On the important matter of ventilation, Mr. Herr states, that while it is advisable to leave houses open where there are newly planted Carnations, since they have been accustomed to cool nights out-of-doors, and will start quicker if the temperature is not raised too suddenly, they are, nevertheless, very susceptible to direct drafts, so that it is a good practice to tack up muslin over the ventilators, even when they are kept open day and night.

A Washington correspondent of the *Florists' Exchange* notes that Sweet Peas were sown about the beginning of August in the garden of the Agricultural Department in a border fully exposed to the sun. Notwithstanding the heat and drought the seed germinated well, and the plants have grown robust and healthy, free from insects and mildew, and were thickly covered with buds in early October, so that abundant bloom will be secured if frost is delayed long enough. So far as this experiment is decisive, it shows that it would not be difficult to have Sweet Peas at Christmas-time by planting them in a deep frame in late summer, covering them with sashes as frost appears, and adding some fire-heat when cold weather comes. There is so much difficulty in growing other kinds of Peas for autumn use, and it is so well known that the earlier Sweet Peas are planted in the spring the better will be their summer bloom, that we can hardly hope that these plants will flower freely out-of-doors in autumn, if, indeed, it is desirable that they should do so. We might become wearied with even so beautiful a flower as the Sweet Pea if it were common all the year round.

Grapes continue abundant and in great variety. A good quality of Concords sell at retail as low as twenty cents for a ten-pound basket, and Delaware, Niagara and Catawba grapes cost but little more. Flame Tokays from California are ten cents a pound, choice lots, such as Humphreys and Stephens, bringing fifteen cents a pound. Almeria grapes are no less plentiful, and are offered on the sidewalk-stands for ten to twenty-five cents a pound. According to the *Fruit Trade Journal*, 96,700 barrels of this fruit have already reached this port, or are on the way here, which only lacks 10,000 barrels of the entire importation of last year, and there are yet six weeks in which these grapes are shipped. Persons who wish a still more expensive grape can be gratified by buying the hot-house product, which now brings a dollar to a dollar and twenty-five cents a pound, and Gros Colman, from England, may be had at a dollar and a half a pound. A small supply of Rome Beauty, the best apple which has yet come from California, was quickly taken up by a few dealers, and retailed at once for sixty cents to a dollar a dozen. The season of California plums has about ended, but a few Kelseys are still coming, and they are apparently larger, and certainly more attractive in appearance, than any seen here this season. They retail for sixty cents a dozen. German prunes, from Rochester, in small supply, bring two dollars for a ten-pound basket. California nectarines are sixty cents a dozen. The best Florida pineapples bring sixty cents apiece, forty cents being asked for choice Havana fruit, inferior qualities selling slowly at poor prices. The first Florida Navel oranges and selected grapefruit are each a dollar a dozen, Japanese persimmons, from the same state, selling at sixty cents a dozen.

Writing in a recent number of *Zoe* of the "Native Habits of Sequoia gigantea," with reference to the failure which often attends attempts to cultivate this tree, Mr. Gustav Eisen says: "Sequoia trunks and cones have been dug up out of many wells on the plains of the Sacramento and San Joaquin valleys, indisputable proof that the tree in former ages extended to the plains. With the advent of a drier and warmer climate the trees retreated to the hills, higher in the south, lower in the north. At last they became isolated groves; finally, in some localities, isolated trees. Only in the southern groves do we find an abundance of young trees; in some of the northern groves we search in vain for any seedlings. What conclusion can we draw from this? That the Sequoia gigantea delights in rich and wet soil, in sheltered positions, and that it occurs in groves. The folly of planting this tree in dry, exposed places, singly or in rows, as is now done everywhere in this state, as well as in other parts of the United States, and in Europe, is therefore evident. Lately I passed an avenue of Sequoias which were all dying out. The cause lay near at hand —dry soil, no artificial irrigation, no rain for six months, hard adobe soil, full exposure to winds, the trees planted in rows or singly. If these trees had been set in groups of a hundred on rich, moist land where irrigation can be resorted to in the summer, they would have protected themselves and they would have thrived." All the natural groves which now exist, Mr. Eisen explains, "are protected from the north winds more or less, and all face the south and west. All grow where moisture is abundant, always around springs, creeks, ponds or meadows, or at least in places where moisture never fails. The further away from the water, the drier the soil, the smaller and poorer are the trees. In many instances the largest trees circle around a beautiful meadow, crowding each other where space is available, or towering singly where there is only ground enough for one."